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PATENT & TRADEMARK OFFICE

WFVA/NOKIA File Nos.: 944-003.027-1/NC32439US

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Re application of: Jussi Numminen

Serial No.: 09/930,379 : Examiner: S. C. Hom

Filed: August 15, 2001 : Group Art Unit: 2666

For: **METHOD AND APPARATUS FOR DISCONTINUOUS RECEPTION SCHEME AND POWER SAVING MODE FOR USER EQUIPMENT IN PACKET ACCESS MODE**

MAIL STOP APPEAL BRIEFS - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

BRIEF FOR APPELLANT

Sir:

This is an appeal from an Official Action mailed 19 September 2006, made final, including an Advisory Action mailed 2 February 2006.[1]

A Notice of Appeal was mailed on 23 February 2006 with a return receipt postcard. The Patent Office stamped and mailed the return receipt postcard back to applicant on 28 February 2006.

This Brief is being filed in triplicate with a fee in the amount of $500.00 in accordance with 37 CFR §1.17(c).

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[1] I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, Alexandria, VA 22313-1450.

William J. Barber — Date 6/28/06

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I. THE REAL PARTY IN INTEREST

The real party in interest is Nokia Mobile Phones, Ltd., a corporation duly organized and existing under the laws of Finland, and having a principal place of business at Keilalahdentie 4, FIN-02150, ESPOO, Finland.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

III. STATUS OF CLAIMS

Claims 1 - 29 are pending.

Claims 1-5, 7, 9-10, 12, 15-16 and 21-26 stand rejected, and are being appealed.

Dependent claims 6, 8, 11, 13-14, 17-20 and 27-29 are objected to but indicated to be allowable if amended to include the limitations from the base claim from which they depend and any intervening claims.

IV. STATUS OF AMENDMENTS

All responses and amendments submitted in response to the September 19th Final Rejection have been entered.

V. SUMMARY OF THE INVENTION

1. The Problem In The Art

In the prior art, the form and content of information being transmitted over wireless telecommunications systems has changed dramatically over the last decade. In first generation wireless networks, analog cellular systems provided primarily person-to-person communications enabling one person with a wireless user equipment (UE), e.g. a mobile phone or terminal, to communicate with another person on either a landline or other wireless user equipment. In this system, voice communications was typically the only content being transmitted. In second generation wireless networks, digital systems enabled the voice communications to be complemented with other services such as text messaging and access to data networks, which are growing rapidly. In third generation wireless networks, such as wideband code division multiple access (WCDMA) systems, a packet service session may include multimedia communications with person-to-person communication enhanced with high quality images and video, as well as access to information and services on public and private networks. In a packet service session mode, the packet service session may include the transfer of one or more packets, blocks, frames or cells of data depending on the communications protocol and may have a much longer duration of time than data sessions in the first and second generation wireless networks

because the transfer of high quality images and video is likely to contain a multiplicity of packets, blocks, frames or cells of data, all possibly taking different paths in the network in order to get from a content providing node to any given user equipment requesting such content.

As described in the "Background of the Invention" section of the patent application, in a WCDMA discontinuous radio link operation mode, the packet service session or mode can be active for a relatively long period of time, and due to a bursty nature of transferred data there is no data flow activity between an end-user and the communications network. During this period, the user equipment (UE) is only performing neighbor cell measurements, and not even performing these measurements if radio conditions are stable and new commands from the network have not been received. From a user's point of view, the terminal is consuming power but not providing good performance (long service time).

In the prior art, the UE receiver is active during a whole packet connection. (In WCDMA, during a packet transfer session the UE can be in CELL-FACH and CELL-DCH states.) A mechanism to provide power saving in the UE receiver by discontinuous reception during a packet session or mode does not exist in the prior art, including in either Dent's or Abbadessa's communication systems.

The operation time of the UE in the packet service mode is fully dependent on operator radio bearer (RB) release settings (which are not specified) and how fast the connection is released after the packet transfer session.

In one case, since packet transmission can start in any frame, all slots in the frame in the downlink (DL) have to contain transport format combination indicator (TFCI) bits, the receiver (rx) has to be on during the whole frame in all frames in order to decode the TFCI, and TFCI decoding has to be performed in each frame. (Handover measurements are also assumed to be running continuously.) With the help of the TFCI, the UE detects whether the dedicated physical data channel (DPDCH) (packet) exists. If not all slots in the frame in the DL contain TFCI bits, then the UE has to use a pilot energy comparison method first to evaluate whether the DPDCH exists in the frame. In this case, all the slots only contain pilot and TFCI information only if DPDCH exists. In both of these cases, it means that the rx side has to be on and doing decoding in each slot in the frame. Thus, no rx side battery savings can be achieved during the dedicated physical control channel (DPCCH) gating.

Alternatively, in case the network is able to schedule the time instants when new packets are transferred to the user equipment (UE), it is possible to signal to the UE an activity

period value, which indicates the radioframe(s) the UE's have to be able to receive and decode from the network. During the same activity period, the UE is able to send measurement messages in reverse link (uplink) to the network.

2. The Claimed Solution

The inventor was the first to recognize the aforementioned problem in the art and provide a solution to the same. To solve this problem, the inventor designed a new and unique method for operating user equipment in a telecommunication network for receiving packets during a packet service mode. The method comprises the steps of:

receiving one or more packets during the packet service mode; and

entering the user equipment into a discontinuous reception mode by receiving either:

a) two or more slots of each radio frame, or

b) one or more frames; and

powering down receiver circuitry of the user equipment for either a) the remaining slots of the radio frame or b) one or more predefined periods, signaled by the telecommunication network, so as to establish a discontinuous radio link for the user equipment in the telecommunication network in a physical radio transmission layer when receiving the one or more packets while maintaining

the logical connection in higher protocol layers during the packet service mode, as recited in claim 1.

In the discontinuous reception mode, the user equipment switches off the receiver circuitry for a part of the radio frame or one or more radio frames, which clearly occurs during the packet service mode when data is being transferred to the user equipment, as recited in dependent claims 10.

In effect, the whole thrust of the claimed invention is to turn the user equipment (UE) receiver off during the packet service mode in order to save precious battery power.

Similarly, independent claim 22 recites user equipment for operating in a telecommunication network for receiving one or more packets during a packet service mode and powering down receiver circuitry of the user equipment during the packet service mode in order to save precious battery power; while independent claim 26 recites a base station having similar features as that recited in independent claims 1 and 22.

VI. ISSUE

The following issues will be addressed in the Arguments:

The non-obviousness of claims 1-5, 7, 9-10, 12, 15-16, 21-22 and 26 over Dent (United States Patent No. 5,239,557) in view of Abbadessa (United States Patent No. 6,236856).

The non-obviousness of claims 23-25 over Dent (United States Patent No. 5,239,557) and Abbadessa (United States Patent No. 6,236,856) in view of Vembu (United States Patent No. 6,259,928).

VII. GROUPING OF THE CLAIMS

The grouping of the claims is as follows:

Independent claims 1, 22 and 26 stand or fall together.

Dependent claims 2-5, 7, 9-10, 12, 15-16, 21, 23-25 and 27-29 stand or fall in relation to independent claims 1, 22 and 26.

The remaining claims 6, 8, 11, 13-14, 17-20 and 27-29 are grouped together as allowable claims.

VIII. ARGUMENTS

A. CLAIM 1

Claim 1 is rejected as being obvious over the proposed combination of Dent in view of Abbadessa.

The rejection is respectfully traversed because the proposed combination does not teach or suggest the claimed method for operating user equipment in a telecommunications network for receiving packets during a packet service mode, wherein the user equipment (UE) is entered into a discontinuous reception mode when receiving packets, the receiver circuitry is powered down during the packet service mode, while the logical connection is maintained in higher protocol layers during the packet service mode, as recited in the independent claim 1.

In contrast to the claimed invention, Dent discloses a system based on CDMA discontinuous reception, but clearly the receiver is not powered down during a packet service mode. Instead, the receiver continues to operate, as described on Dent, column 3, lines 33-51, including by decoding one or more other signals. In view of this, Dent's receiver is clearly operating when there is no data flow activity, especially during a packet session or mode, and consuming limited battery resources in the device. Clearly, Dent neither recognizes this extra power consumption to be a problem, nor suggests a solution thereto. The reasoning in the paragraph bridging pages 6-7 of the

September 19th Office Action recognizes this fundamental deficiency in Dent and looks to Abbadessa to make up for the same.

However, it is respectfully submitted that Abbadessa does not make up for this deficiency, because Abbadessa discloses that its MS 106 in Figure 1 powers down a large part of its circuitry for a high percentage of time when in the idle mode, but does not even remotely suggest to do so during a packet service mode when receiving one or more packets. In other words, similar to Dent, Abbadessa's MS 106 does not power down during a packet service mode when receiving one or more packets. In view of this, also similar to Dent's, Abbadessa's MS 106 is clearly operating when there is no data flow activity during a packet session or mode, and consuming limited battery resources in the device. Furthermore, similar to Dent, Abbadessa neither recognizes this extra power consumption when operating unnecessarily during a packet service mode to be a problem, nor suggests a solution thereto. For example, Abbadessa does not suggest to go into the idle mode during such a packet service mode. Because of this, it is respectfully submitted that the reasoning in paragraph 3 of the September 19th Office Action, including the first full paragraph on page 7 thereof, overlooks this point, including the fact that Abbadessa, column 7, lines 42-45, merely relates to the known prior art technique of powering down MS circuitry only

during an idle mode state. In view of this, it is respectfully submitted that both cited prior art references not only completely fail to teach or suggest the whole thrust of the basic invention, but also completely fail to even recognize the problem being addressed by the claimed invention, i.e. to minimize the extra power consumption when operating unnecessarily during a packet service mode.

Therefore, it is respectfully submitted that, since neither cited reference teaches or suggests powering down during the packet service mode when receiving one or more packets which is the whole thrust of the claimed invention, and since neither cited reference completely fail to recognize the problem being addressed by the claimed invention, the proposed combination cannot, and does not, result in the claimed invention.

Response to Remarks
in Paragraph 1 of September 19th Office Action

In response to the points made in paragraph 1 of the Office Action, it is respectfully submitted that applicant's arguments are not based on attacking the cited references individually, but instead are based on that disclosed in the cited references ***as a whole***, which is consistent with the reasoning set forth in In Re Keller, 208 USPQ 871 (Fed. Cir. 1986). For example, in order to end up with the claimed invention, one of ordinary skill in the

art would have to first be motivated to combined the two cited references in the manner proposed, then be further motivated to further modify the proposed combination so that the powering down is done during the packet service mode instead of the idle mode as taught in Abbadessa. It is respectfully submitted that nothing on the record suggests why one of ordinary skill in the art would be motivated to combined the cited references in the manner proposed, then be further motivated to further modify the proposed combination in order to end up with the claimed invention. It is respectfully submitted that nothing on the record, including that disclosed in Dent or Abbadessa when viewed as a whole, suggests why one of ordinary skill in the art would be motivated to combined the cited references in the manner proposed, or why one of ordinary skill in the art would be motivated to make the further modification thereto, especially when neither cited references ***as a whole*** even remotely suggests the whole thrust of the claimed invention. For these reasons, it is respectfully submitted that the patent application itself is the only source of such motivations on the record, which is nothing more than hindsight reconstruction.

Response to Remark in February 2nd Advisory Action

Finally, in the February 2nd Advisory, the remarks state that: "Abbadessa in col. 7 lines 42-45 which recite power down

part of the circuitry for a percentage of time under certain condition, such as MS in idle mode, a technique being known as discontinuous reception clearly reads on powering down during packet service mode when receiving packets as argued in page 2 of the remarks." However, in response thereto, it is respectfully submitted that Abbadessa, column 7, lines 42-45, merely relates to the known prior art technique of powering down MS circuitry during an idle mode state. There is no suggestion in Abbadessa, column 7, lines 42-45, for the receiver circuitry to power down during the packet service mode, while the logical connection is maintained in higher protocol layers during the packet service mode, which is the whole thrust of the claimed invention. Moreover, there is no suggestion in Abbadessa as a whole, including that in Abbadessa, column 7, lines 42-45, to power down the receiver circuitry during the packet service mode in order to minimize the extra power consumption when operating unnecessarily during such a packet service mode.

B. INDEPENDENT CLAIMS 22 AND 26

Consistent with that set forth above, it is respectfully submitted that independent claim 22 recites user equipment for operating in a telecommunication network for receiving one or more packets during a packet service mode and powering down receiver circuitry of the user equipment during the packet

service mode in order to save precious battery power. Similarly, independent claim 26 recites a base station having similar features as that recited in independent claims 1 and 22. For the reasons set forth above, it is respectfully submitted that the proposed combination of Dent in view of Abbadessa does not teach or suggest the user equipment or base station recited in independent claims 22 and 26.

C. THE ALLOWABLE CLAIMS 6, 8, 11, 13-14, 17-20 and 27-29

In paragraph 5 of the September 19th Office Action, dependent claims 6, 8, 11, 13-14, 17-20 and 27-29 are deemed allowable if rewritten or amended to include the base claim and any intervening claims. In view of the aforementioned remarks, it is respectfully submitted that these claims are deemed patentable over the cited prior art.

D. THE REMAINING DEPENDENT CLAIMS

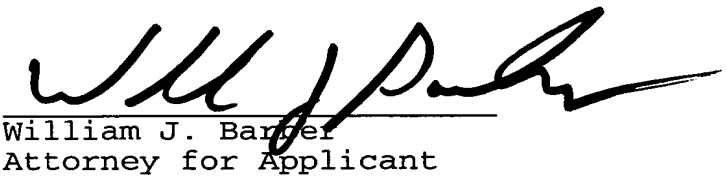
Dependent claims 2-5, 7, 9-10, 12, 15-16 and 21 and 26 are similarly rejected based on the proposed combination alone or further in combination with Vembu. Since these claims all contain the aforementioned limitations of the main claim from which they depend, they are believed patentable for the reasons set forth above. Moreover, it is respectfully submitted that Vembu does not make up for the deficiency in teaching of the

proposed combination in relation to the point of novelty of the claimed invention.

E. CONCLUSION

In view of this, it is respectfully submitted that the reasoning in the rejection of these claims is in error, and should be reversed.

Respectfully submitted,



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WJB/bb
June 28, 2006

IX. APPENDIX

The following claims are pending in the patent application:

1. (Previously amended) A method for operating user equipment in a telecommunication network for receiving packets during a packet service mode, comprising the steps of:

receiving one or more packets during a packet service mode; and

entering the user equipment into a discontinuous reception mode by receiving either:

a) two or more slots of each radio frame, or

b) one or more frames; and

powering down receiver circuitry of the user equipment for either a) the remaining slots of the radio frame or b) one or more predefined periods, signaled by the telecommunication network, so as to establish a discontinuous radio link for the user equipment in the telecommunication network in a physical radio transmission layer when receiving the one or more packets while maintaining the logical connection in higher protocol layers during the packet service mode.

2. (Previously amended) The method according to claim 1, **characterized in that** packet transmission starts in one out of every K radio frames.

3. (Previously amended) The method according to claim 1, **characterized in that** the two or more slots are consecutive slots in the radio frame.

4. (Previously amended) The method according to claim 1, **characterized in that** the two or more slots are non-consecutive slots in the radio frame.

5. (Previously amended) The method according to claim 1, **characterized in that** the user equipment has an active period of two or more consecutive slots or idle frame(s) prior to its own reception for performing neighbor measurements and power control functions.

6. (Previously amended) The method according to claim 5, **characterized in that** the user equipment adapts the active period depending on neighborhood conditions by increasing the active period when neighborhood conditions are unstable, and decreasing the active period when neighborhood conditions are stable.

7. (Previously amended) The method according to claim 1, **characterized in that** the user equipment responds to a change in the status of a transport format combination indicator (TFCI) field in the two or more slots of the radio frame for determining an end of a data packet.

8. (Previously amended) The method according to claim 7, **characterized in that** in a discontinuous reception mode the user equipment monitors a command in a transmission power control (TPC) field in the two or more slots of the radio frame and the status of the transport format combination indicator (TFCI) field in order to respond to commands from the telecommunications network.

9. (Previously amended) The method according to claim 7, **characterized in that** the user equipment determines a start of a new packet transmission by monitoring the status of the transport format combination indicator (TFCI) field in a previous radio frame before a new packet data radio frame.

10. (Previously amended) The method according to claim 1, **characterized in that** in the discontinuous reception mode the user equipment switches off the receiver circuitry for a part of the radio frame or one or more radio frames.

11. (Previously amended) The method according to claim 10, **characterized in that** the radio frame includes fifteen slots, and the part of the radio frame that the user equipment switches off the circuitry in the receiver is thirteen of fifteen slots.

12. (Previously amended) The method according to claim 1, **characterized in that** the user equipment receives higher layer signalling from a radio network controller or a base station in the telecommunications network that defines a period where the user equipment needs to perform a decoding of the radio frame or slots in order to detect if packet transmission is active.

13. (Previously amended) The method according to claim 12, **characterized in that** the user equipment determines that the radio frame contains data targeted by decoding the radio frame using a cyclic redundancy code and having a correct cyclic redundancy code result.

14. (Previously amended) The method according to claim 12, **characterized in that** the user equipment determines that the radio frame does not contain data targeted by decoding the radio frame using a cyclic redundancy code and having an incorrect cyclic redundancy code result; and waits an agreed period of time

before decoding a subsequent radio frame.

15. (Previously amended) The method according to claim 1, **characterized in that** in a discontinuous period the user equipment waits a fixed discontinuous period of time.

16. (Previously amended) The method according to claim 1, **characterized in that** in a discontinuous period the user equipment waits a variable discontinuous period of time.

17. (Previously amended) The method according to claim 16, **characterized in that** the user equipment, a radio network controller or a base station in the telecommunication network or both perform an algorithm randomizing the variable discontinuous period.

18. (Previously amended) The method according to claim 16, **characterized in that** in a random non-receiving period the network defines the discontinuous period where the user equipment needs to perform a decoding of frame or slots in order to detect if packet transmission is active or not.

19. (Previously amended) The method according to claim 18, **characterized in that** if the packet transmission is not active,

the next active period follows after a random period of N radio frames.

20. (Previously amended) The method according to claim 19, **characterized in that** a radio network controller or a base station in the network signals the value of N to the user equipment.

21. (Previously amended) The method according to claim 1, **characterized in that** the user equipment concurrently enters into a discontinuous transmit mode and performs one or more closed loop power control sequences for following the fading of an uplink, a downlink or both when its transmitter is active.

22. (Previously amended) User equipment for operating in a telecommunication network for receiving one or more packets during a packet service mode, **characterized in that**

the user equipment includes a user equipment power control loop module that enters the user equipment into a discontinuous reception mode for receiving two or more slots of each radio frame with receiver circuitry and for powering down the receiver circuitry for the remaining slots of the radio frame, so as to establish a discontinuous radio link for the user equipment in the telecommunication network in a physical radio transmission

layer when receiving the one or more packets while maintaining the logical connection in higher protocol layers during the packet service mode.

23. (Previously amended) The equipment according to claim 22, **characterized in that** the power control loop module checks for packet transmission in one out of every K radio frames.

24. (Previously amended) The equipment according to claim 22, **characterized in that** the power control loop module checks two or more consecutive slots in the radio frame.

25. (Previously amended) The equipment according to claim 22, **characterized in that** the power control loop module checks two or more non-consecutive slots in the radio frame.

26. (Previously amended) A base station for operating in a telecommunication network for providing one or more packets during a packet service mode to user equipment having receiver circuitry, **characterized in that**

the base station includes a base station power control loop module that provides a signal to the user equipment to enter into a discontinuous reception mode for receiving two or more slots of each radio frame and to power down its receiver circuitry for the

remaining slots of the radio frame, so as to establish a discontinuous radio link for the user equipment in the telecommunication network in a physical radio transmission layer when receiving the one or more packets while maintaining the logical connection in higher protocol layers during the packet service mode.

27. (Previously amended) The base station according to claim 26, **characterized in that** the signal contains information for the user equipment to check for packet transmission in one out of every K radio frames.

28. (Previously amended) The base station according to claim 26, **characterized in that** the signal contains information for the user equipment to check two or more consecutive slots in the radio frame.

29. (Previously amended) The base station according to claim 26, **characterized in that** the signal contains information for the user equipment to check two or more non-consecutive slots in the radio frame.